



A Structured Review Instrument Improves the Quality of Orthopaedic Journal Club

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OBJECTIVE: We asked the following questions: 1. Does the use of an structured review instrument (SRI) at journal club increase presentation quality, as measured objectively by a standardized evaluation rubric? 2. Does SRI use increase the time required to prepare for journal club? 3. Does SRI use positively impact presenter perceptions about confidence while presenting, satisfaction, and journal club effectiveness, as measured by postparticipation surveys?

DESIGN: A prospective study was designed in which a grading rubric was developed to evaluate journal club presentations. The rubric was applied to 24 presentations at journal clubs prior to introduction of the SRI. An SRI was developed and distributed to journal club participants, who were instructed to use it to prepare for journal club. The grading rubric was then used to assess 25 post-SRI presentations and scores were compared between the pre- and post-SRI groups. Presentations occurred at either trauma, pediatrics, or spine subspecialty journal clubs. Participants were also surveyed regarding time requirements for preparation, perceptions of confidence while presenting, satisfaction, and perceptions of overall club effectiveness.

SETTING: A single academic center with an orthopaedic surgery residency program.

PARTICIPANTS: Resident physicians in the department of orthopaedic surgery.

RESULTS: Mean presentation scores increased from 14.0 ± 5.9 (mean \pm standard deviation) to 24.4 ± 5.2 after

introduction of the SRI ($p < 0.001$). Preparation time decreased from a mean of 47 minutes to 40 minutes after SRI introduction ($p = 0.22$). Perceptions of confidence, satisfaction, and club effectiveness among trainees trended toward more positive responses after SRI introduction (confidence: 63% positive responses pre-SRI vs 72% post-SRI, $p = 0.73$; satisfaction: 64% vs 91%, $p = 0.18$; effectiveness: 64% vs 91%, $p = 0.19$).

CONCLUSIONS: The use of a structured review instrument to guide presentations at orthopaedic journal club increased presentation quality, and there was no difference in preparation time. There were trends toward improved presenter confidence, satisfaction, and perception of journal club effectiveness. SRI utilization at orthopaedic journal club may be an effective method for increasing the quality of journal club presentations. Future work should examine the relationship between presentation quality and overall club effectiveness. (J Surg Ed 76:294–300. © 2018 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: journal club, orthopaedic education, structured review instrument, orthopaedic training

COMPETENCIES: Interpersonal and Communication Skills, Medical Knowledge, Practice-Based Learning and Improvement

INTRODUCTION

Journal clubs have a long history in medicine and orthopaedic surgery, and are common in orthopaedic departments around the country.^{1,5,6} Important goals of these clubs include teaching residents to critically evaluate scientific articles, instilling formal habits for reading scientific articles, and facilitating resident learning about current research.^{4,6} There are multiple possible formats for journal clubs.⁵ In orthopaedics,

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This study was reviewed by our institution's IRB and found to be exempt.

the most common is trainee led discussions of assigned articles.^{5,6} At our institution, a similar format is followed: trainees are assigned a particular article in advance by a faculty leader and subsequently must read, analyze, and present it.

One important factor in presentation-driven journal clubs is the quality of the presentations. Poorly structured presentations can fail to highlight important points of the study being discussed, which may lead to less informative discussion overall. In our experience, this can subsequently lead to poor attendance, and journal clubs that are of limited educational value. The use of a structured review instrument (SRI) that can be used to critique and present articles has been described.^{3,5} In general, SRI take the form of standardized checklists that guide the presenter toward important items when reviewing and presenting articles. In the Emergency Medicine literature, the use of a review instrument was shown to significantly increase satisfaction with journal club without increasing workload,³ but the authors did not comment on whether presentation quality was affected. In the orthopaedic literature, orthopaedic specific structured review instruments have been described,⁵ however, no data regarding the effectiveness of these instruments has been presented.

Therefore, we asked: 1. Does the use of an SRI at journal club increase presentation quality, as measured objectively by a standardized evaluation rubric? 2. Does SRI use increase the time required to prepare for journal club? 3. Does SRI use positively impact presenter perceptions about confidence while presenting, satisfaction, and journal club effectiveness, as measured by postparticipation surveys?

MATERIALS AND METHODS

A prospective interventional study was designed to assess presentation quality at journal club before and after introduction of a structured review instrument. The study was reviewed by our Institutional Review Board and found to be exempt. At our institution, journal clubs are held on a routine basis and are subspecialty specific; the Trauma, Pediatrics, and Spine services were selected to participate in the study. These journal clubs are all faculty-led, with articles assigned to residents who present a synopsis and initiate discussion. Articles are chosen by senior residents for Trauma journal clubs and are selected by faculty in the Pediatrics and Spine journal clubs. Participation of on-service residents is mandatory, and meetings occur outside of clinical duty hours. Each club includes 4 to 8 articles and lasts 1 to 2 hours, with no limitation on presentation time.

Initially, multiple journal clubs were held in which presentations were graded by an orthopaedic surgery faculty

member using a journal club evaluation grading rubric (Appendix 2). The grader was a member of the faculty in attendance at the journal club meeting, with subspecialty training in the field of interest. This rubric was modified to suit an orthopaedic surgery journal club from a previous version originally described by Blommel and Abate, who validated the rubric in the pharmacology literature and found it to have an intraclass correlation coefficient of 0.92.² The rubric assigned points for various aspects of the presentation, including an accurate overview of the study, thorough analysis, preparedness, and critical thinking. Possible scores ranged from 0 to 30. Early in the study, no changes were made to the existing journal club format, and presentations were given at the discretion of the resident without any specific standardized preparation.

A power analysis was performed after collecting pilot data from 6 journal club presentations in the pre-SRI group. An effect size of 0.83 was calculated based on the difference in mean scores between junior (postgraduate year [PGY] 1-3) and senior (PGY 4-6) trainee presentations. Since literature on the topic of SRI use is sparse, we used this effect size to calculate the number of presentations required for each of the study groups, assuming that the effect size between junior and senior residents at baseline might mimic that of all participants before and after introduction of the SRI. Using an alpha of 0.05 and power of 0.80, it was determined that 19 presentations were needed in each group (G*Power, version 3.1.9.2, Kiel, Germany) to detect a difference in grading rubric scores.

After a series of journal club meetings were held during which presentations were given in an unstructured format, the SRI was introduced, and its use at journal clubs was mandated. The SRI used in this study was based on the instrument reported by Dirschl et al. It was modified to fit the time requirements of our journal clubs and to cover factors thought important by faculty⁵ (Appendix 1). A faculty member again scored each presentation using the same evaluation rubric.

After each journal club meeting, an electronic survey was sent to each presenter (Qualtrics Survey Tool, Provo, Utah). The survey contained questions about the time required to prepare, confidence level giving the presentation, satisfaction with the journal club, and assessment of overall journal club effectiveness. Questions about confidence, satisfaction, and effectiveness were answered via a Likert scale ranging from 1 to 5, with 1 representing the low end of the scale and 5 representing the high end (i.e., 5 = very confident, very satisfied, and very effective). If trainees presented sequentially at multiple journal clubs within the same subspecialty, they were sent a survey only once.

Statistical analysis using an independent Student's *t* test was performed to compare mean presentation scores between the pre- and post-SRI groups among

TABLE 1. Mean Presentation Scores Before and After Introduction of the Structured Review Instrument Among All Participants, Senior Trainees (PGY 4-6), and Junior Trainees (PGY 1-3)

	Before SRI	After SRI	p Value
All participants	14.0 ± 5.9	24.4 ± 5.2	<0.001*
Senior trainees	15.8 ± 5.2	24.6 ± 5.1	<0.001*
Junior trainees	12.3 ± 6.3	23.9 ± 5.6	<0.001*

Values are presented as mean ± standard deviation. SRI = structured review instrument. p values are the result of an unpaired Student's *t* test. * indicates result is statistically significant.

junior trainees, senior trainees, and all participants. Answers to survey questions were analyzed for differences before and after intervention using an independent Student's *t* test for continuous variables and a Mann-Whitney *U* test for ordinal variables (Microsoft Excel 2013, Redmond, Washington; GNU PSPP, Free Software Foundation, Boston, Massachusetts). The level of significance was set to an alpha of 0.05.

RESULTS

Does the use of an SRI at journal club increase presentation quality, as measured objectively by a standardized evaluation rubric?

There were 24 participants in the pre-SRI group and 25 in the post-SRI group. Prior to introduction of the SRI, mean presentations scores were 14.0 ± 5.9 for all presenters, 15.8 ± 5.2 for senior trainees (PGY 4-6), and 12.3 ± 6.3 for junior trainees (PGY 1-3). After introduction of the SRI, mean scores increased to 24.4 ± 5.2, 24.6 ± 5.1, and

23.9 ± 5.9, respectively, which was a statistically significant increase in all cases ($p < 0.05$, Table 1).

Does SRI Use Increase the Time Required to Prepare for Journal Club?

Ninety-two percent of participants in the pre-SRI group and 69% in the post-SRI group completed the electronic survey. In the pre-SRI group, mean preparation time for journal club was 47 ± 18 minutes; this decreased to 40 ± 16 minutes in the post-SRI group. This difference was not statistically significant ($p = 0.22$).

Does SRI use positively impact presenter perceptions about confidence while presenting, satisfaction, and journal club effectiveness, as measured by postparticipation surveys?

There were no significant differences between pre- and post-SRI presenter confidence, satisfaction, and perceived overall effectiveness of journal club, but the trend was toward more positive responses (4s and 5s on the Likert scale) after SRI introduction (Table 2).

DISCUSSION

Structured review instruments have been proposed for use at orthopaedic journal club,⁵ but their effectiveness has not been objectively assessed. At our journal clubs, the introduction of an SRI increased the quality of the presentations delivered by orthopaedic residents. There was no difference in preparation time identified, and there was a trend toward improved presenter confidence, satisfaction, and perception of journal club effectiveness.

TABLE 2. Results of Postjournal Club Survey Before and After Introduction of the Structured Review Instrument. Confidence Level, Satisfaction, and Perceived Journal Club Effectiveness, as Assessed by Presenters, is Reported as the Percentage of Survey Respondents That Selected a Particular Answer Choice on the 1 to 5 Likert Scale.

Preparation Time (Minutes)	Before SRI		After SRI		p Value
	47 ± 18		40 ± 16		
Confidence level (1-5)	2	9%	3	27%	0.73
	3	27%	4	36%	
	4	27%	5	36%	
	5	36%			
Satisfaction (1-5)	2	27%	3	9%	0.18
	3	9%	4	64%	
	4	45%	5	27%	
	5	18%			
Effectiveness (1-5)	2	18%	3	9%	0.19
	3	18%	4	64%	
	4	45%	5	27%	
	5	18%			

Preparation time is listed as mean minutes required to prepare for the presentation ± standard deviation. SRI = structures review instrument. For preparation time, p value is the result of a Student's *t* test. For confidence level, satisfaction, and effectiveness, p value is the result of a Mann-Whitney *U* test.

There is little existing data objectively assessing the impact of a structured review instrument at journal club. Dirschl et al. published an example of an SRI in the orthopaedic literature and commented that it was well received.⁵ The SRI used in the present study was based on this previous instrument and modified to fit our journal club format. The evaluation rubric has also been previously established in the literature and was modified to emphasize factors we believed to be particularly important for evaluation of the orthopaedic literature.² We believe that both the SRI and the grading rubric should be utilized in future research and by residents preparing to present articles at orthopaedic journal club.

Importantly, there was no difference in preparation time with use of the SRI. Other work has demonstrated similar results, with 1 study in the Emergency Medicine literature showing that SRI use did not increase overall workload among presenters.³ This is an important consideration, since the presenters are often residents or fellows who are very busy with clinical and other academic tasks. Beyond improving presentation quality, increasing preparation efficiency may be a secondary reason to consider SRI adoption.

Our findings regarding perceptions of satisfaction and confidence are consistent with previous research on the topic. Burstein et al. reported on the use of an SRI at Emergency Medicine journal club and found that overall satisfaction improved significantly, as did clinical teaching value.³ We found a nearly 30% increase in the number of positive responses after SRI introduction when participants were asked about club effectiveness and their overall satisfaction.

This study has a number of limitations. While it was prospective, it was not blinded or randomized, introducing the possibility of bias. Blinding of the faculty graders was not practical as they were present at journal club and could see the presenters actively using the SRI or not during their presentation. Blinding of the presenters was not required because they were unaware that a second stage (post-SRI) of the study would be initiated while completing the first; however, they may have been aware that the presentations were being graded by the faculty if they observed graders completing the rubric. This introduces a possible Hawthorne effect, and it is unknown to what degree, if any, this affected the results. Randomization was not done because introduction of the SRI to select presenters may have alerted all journal club participants to its existence. Regardless, the effect of SRI introduction on presentation quality is

much more likely related to a true effect than bias alone. Also, we only utilized 1 faculty grader per presentation, and therefore are not able to report on inter-rater reliability of the grading. Additionally, while a power analysis confirmed that this study was adequately powered to detect a difference between rubric scores, power analysis was not done for survey data. It is possible, and even likely that some of the survey responses would have been significantly different post-SRI had the sample size been larger. Finally, the instrument is not validated, and it is unknown whether higher scores might lead to higher quality discussions at journal club, or improve a presenter's ability to interpret and critique the literature; these questions should be the focus of future research.

In conclusion, we found that the use of an SRI objectively increased presentation quality and there was no difference in preparation time. There was a trend toward improved presenter confidence, satisfaction, and perception of journal club effectiveness. We believe that an SRI may be a valuable tool for improving the quality of journal club presentations. Further study in the form of a multi-institution, randomized trial may help determine whether routine inclusion of a Structured Review Instrument should be considered for orthopaedic journal club.

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SUPPLEMENTARY INFORMATION

Supplementary data associated with this article can be found in the online version at <https://doi.org/10.1016/j.jsurg.2018.06.017>.

APPENDIX

Appendix 1. Structured Review Instrument Used by Trainees to Review and Present Journal Articles

Orthopaedic Surgery Structured Review Instrument

Authors and Introduction

Study Title

Author affiliations

Relevant study support
Conflicts of interest?

Study purpose/hypotheses
Is studying this problem
useful and relevant?

Methodology

Design and patients

Study design:

- Randomized controlled trial Prospective observational study
 Retrospective cohort study Case-control study Case series Case report
 Biomechanics Basic science Other

Level of evidence (1-5) reported?

Who (or what specimens, radiographs, cells, etc.) is/are being studied?

Include inclusion/exclusion criteria and recruitment methods

Independent and outcome variables

What is the independent variable or intervention of interest?

What are the outcome (dependent) variables?

Power analysis done?

Statistical analysis type?

Results and Conclusions

How many patients or samples in
each group?

Any lost to follow-up,
excluded after intervention, or crossed-over?

Relevant results for each outcome measure?

Relevant complications?

Authors' conclusions

Critical Analysis

Discussion points

Strengths

Limitations

Are there sources of bias?

If applicable, is the level of
evidence designation appropriate?

Does the study design appropriately test the hypothesis?

Are the authors' conclusions valid?

Will this study change clinical practice?

Modified from Dirschl et al., CORR 2003.

Appendix 2. Grading rubric used by faculty to evaluate presentations

Orthopaedic Surgery Journal Club Evaluation Tool

Presentation date _____ Presenter PGY Year _____ Reviewer _____.

Criteria

Study Overview	2 Points	1 Point	0 Points	Score
Introduction <input type="checkbox"/> Author affiliations and relevant study support <input type="checkbox"/> Study purpose/hypotheses <input type="checkbox"/> Relevance	Accurately and completely reported ALL relevant components	Accurately and completely reported MOST relevant components	Multiple inaccuracies or components missing	
Methods - Design <input type="checkbox"/> Prospective, retrospective, cohort, case-control, case series, basic science, biomechanics/anatomic, etc. <input type="checkbox"/> Blinding and randomization, if applicable <input type="checkbox"/> Level of evidence	Accurately and completely reported ALL relevant components	Accurately and completely reported MOST relevant components	Multiple inaccuracies or components missing	
Methods - Patients <input type="checkbox"/> Setting <input type="checkbox"/> Inclusion and exclusion criteria, if applicable <input type="checkbox"/> Patients recruitment, if applicable				Multiply x2 for this field
Methods - Independent variable <input type="checkbox"/> Description of variable of interest: technique, patient characteristic, diagnostic test, or economic/basic science variable, etc. <input type="checkbox"/> Control group	Accurately and completely reported ALL relevant components	Accurately and completely reported MOST relevant components	Multiple inaccuracies or components missing	
Methods - Outcomes <input type="checkbox"/> Primary outcomes <input type="checkbox"/> Secondary outcomes Methods - Statistics <input type="checkbox"/> Power analysis <input type="checkbox"/> Statistical analysis				Multiply x² for this field
Results <input type="checkbox"/> Number of samples/patients included <input type="checkbox"/> Relevant results for each outcome measure <input type="checkbox"/> Lost to follow up, if applicable <input type="checkbox"/> Control of confounding variables, if applicable <input type="checkbox"/> Complications, if applicable	Accurately and completely reported ALL relevant components	Accurately and completely reported MOST relevant components	Multiple inaccuracies or components missing	
Conclusion <input type="checkbox"/> Brief summary of authors' conclusions				

(continued)

**TOTAL SCORE-
Study Overview**

Study Analysis	6 Points	4 Points	2 Points	0 Points	Score
Study Discussion <input type="checkbox"/> Study strengths <input type="checkbox"/> Study weaknesses and limitations <input type="checkbox"/> Is the study design appropriate (does it test the proposed hypotheses)? <input type="checkbox"/> Is the level of evidence designation appropriate?	ALL components addressed and critiqued, critiques thoughtful	MOST components addressed and critiqued, some relevant questions overlooked	SOME components appropriately addressed and critiqued, many not addressed	NO meaningful critiques	
Study Impact <input type="checkbox"/> What are the study biases? <input type="checkbox"/> Are the authors' conclusions supported? <input type="checkbox"/> Will this change clinical practice?	ALL components addressed and critiqued, critiques thoughtful	MOST components addressed and critiqued, some relevant questions overlooked	SOME components appropriately addressed and critiqued, many not addressed	NO meaningful critiques	

**TOTAL SCORE
Study Analysis**

Preparedness/ Presentation	2 Points	1 Point	0 Points
Score			
Knowledge of Study Details	Well prepared, explained all details thoroughly, and answered all questions correctly/confidently	Mostly well prepared, unaware of some details, correctly answered most questions	Not well versed in study details and unable to answer most questions
Critical Thinking	Provided complete assessment of study's impact, its clinical context, and led discussion	Provided moderate support of impact or context and involved in discussion	Poor assessment of study's impact or context and did not participate in discussion
Presentation Style	Clear, concise, well prepared	Some portions of presentation unclear or did not flow	Presentation not clear, many pauses

**TOTAL SCORE
Preparedness/
Presentation**

Comments:

**TOTAL SCORE (both pages,
Overview, Analysis,
Preparedness)(max = 30)**

Modified from Blommel et al., A Rubric to Assess Critical Literature Evaluation Skills, *American Journal of Pharmaceutical Education*, 2007.